

APPENDIX A

Figures

Figure 1

Jackson Steel Products, Inc.
435 First St.
Mineola, Town of Hempstead

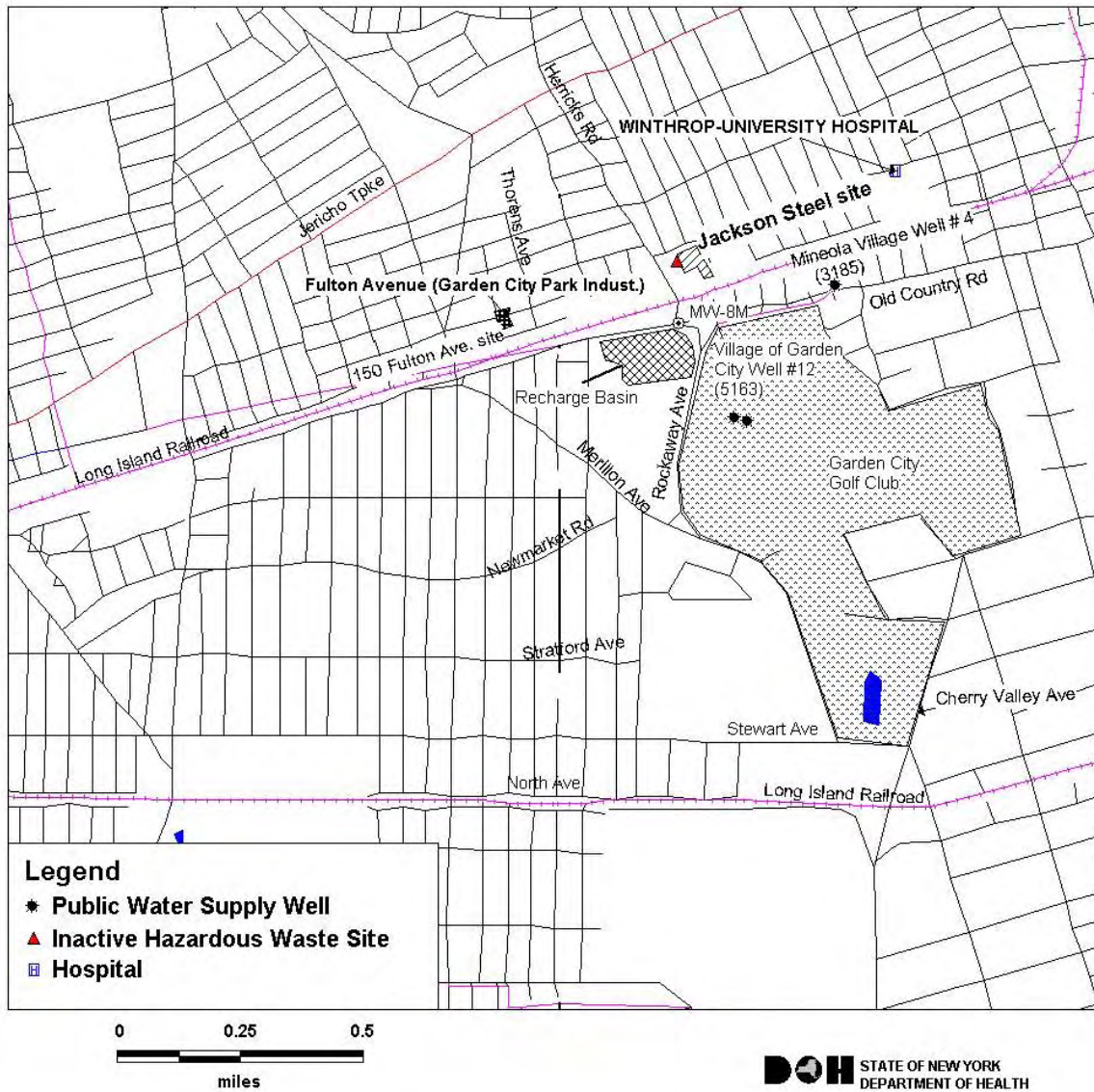


Figure 2

Jackson Steel Products, Inc.
435 First St.
Mineola, Town of Hempstead

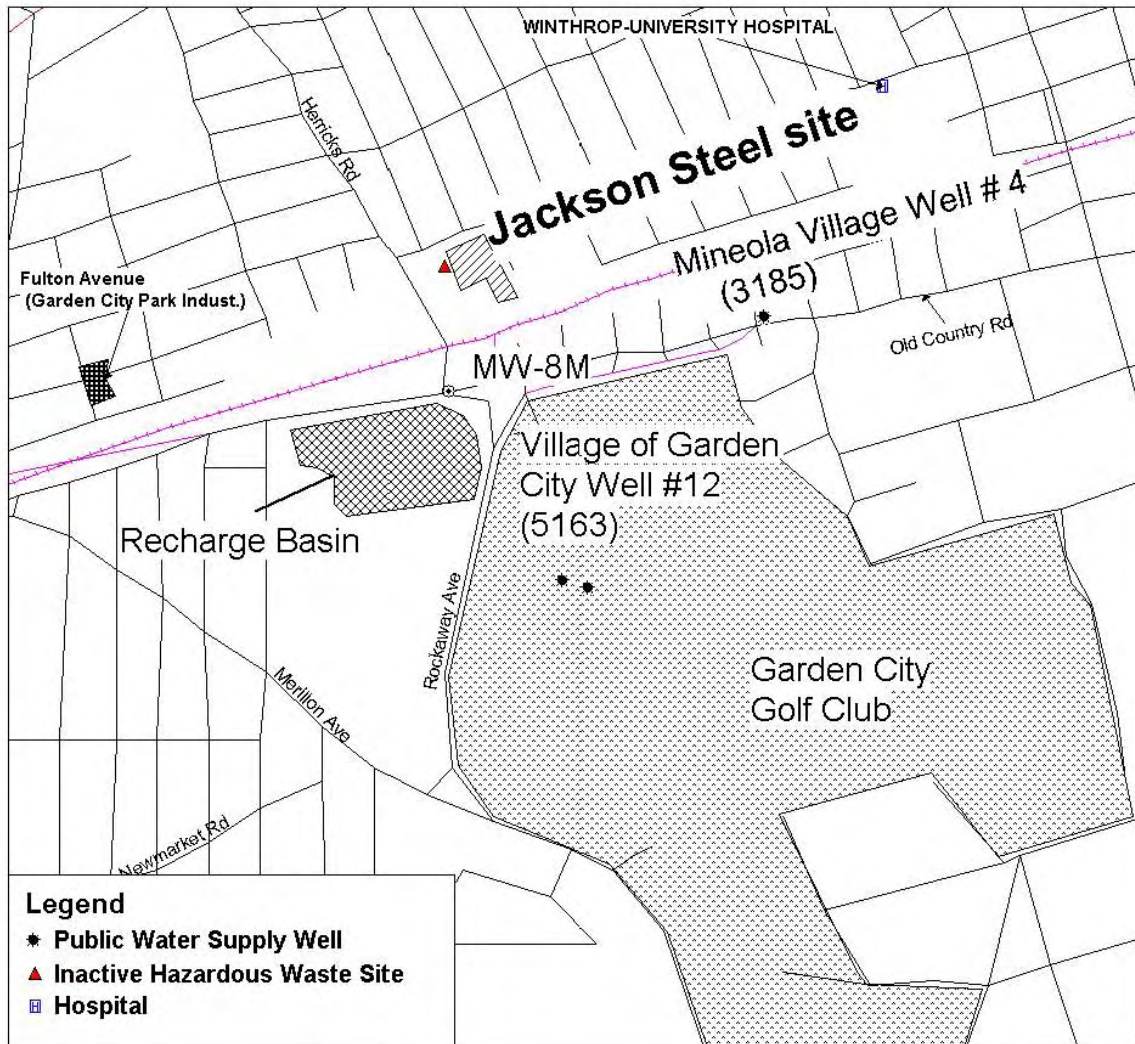


Figure 3

Jackson Steel Products, Inc.
435 First St.
Mineola, Town of Hempstead

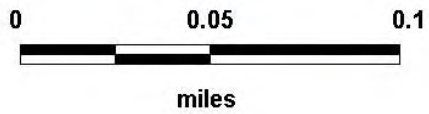


Figure 4
Jackson Steel
Mineola, NY
Nassau County

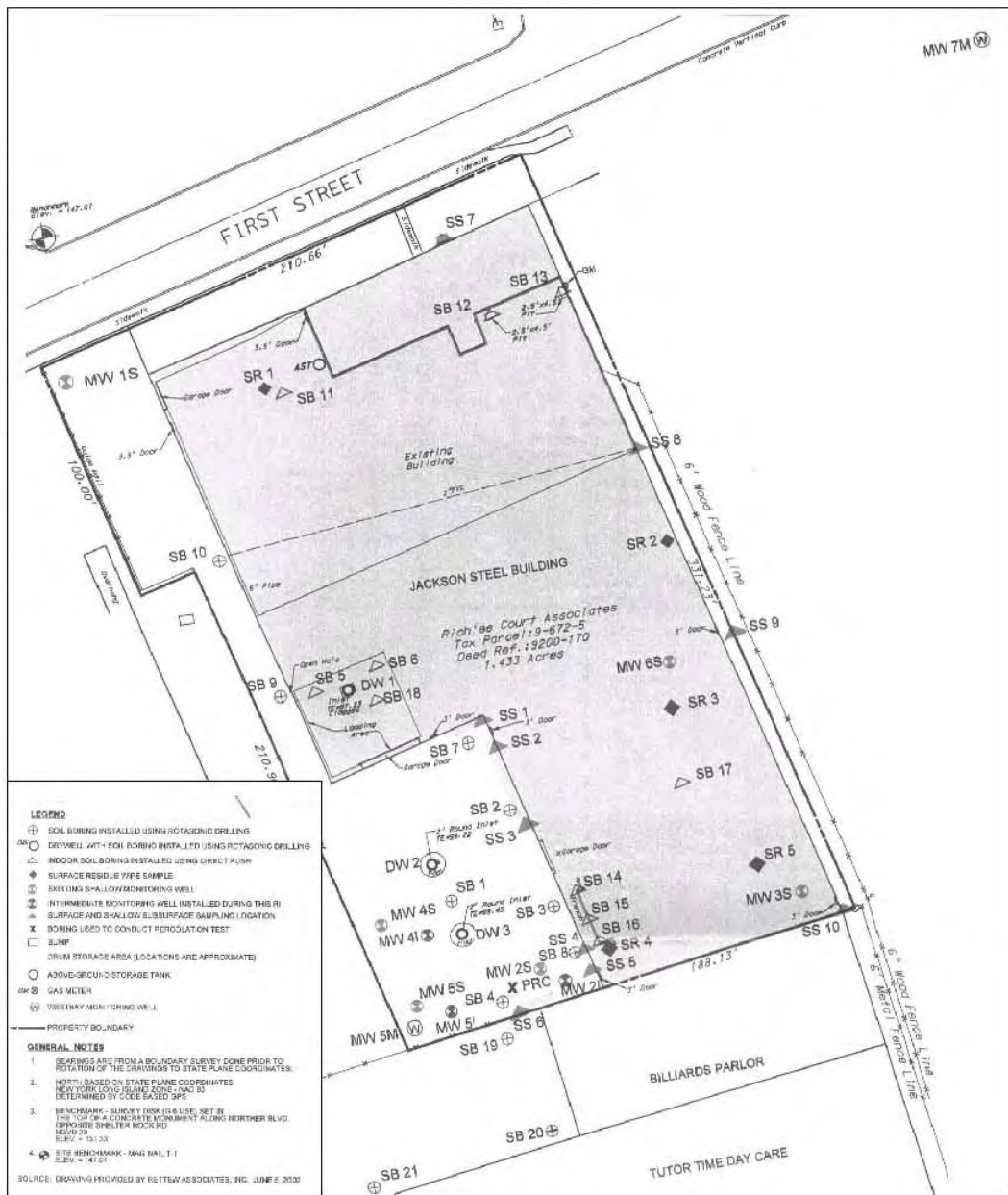
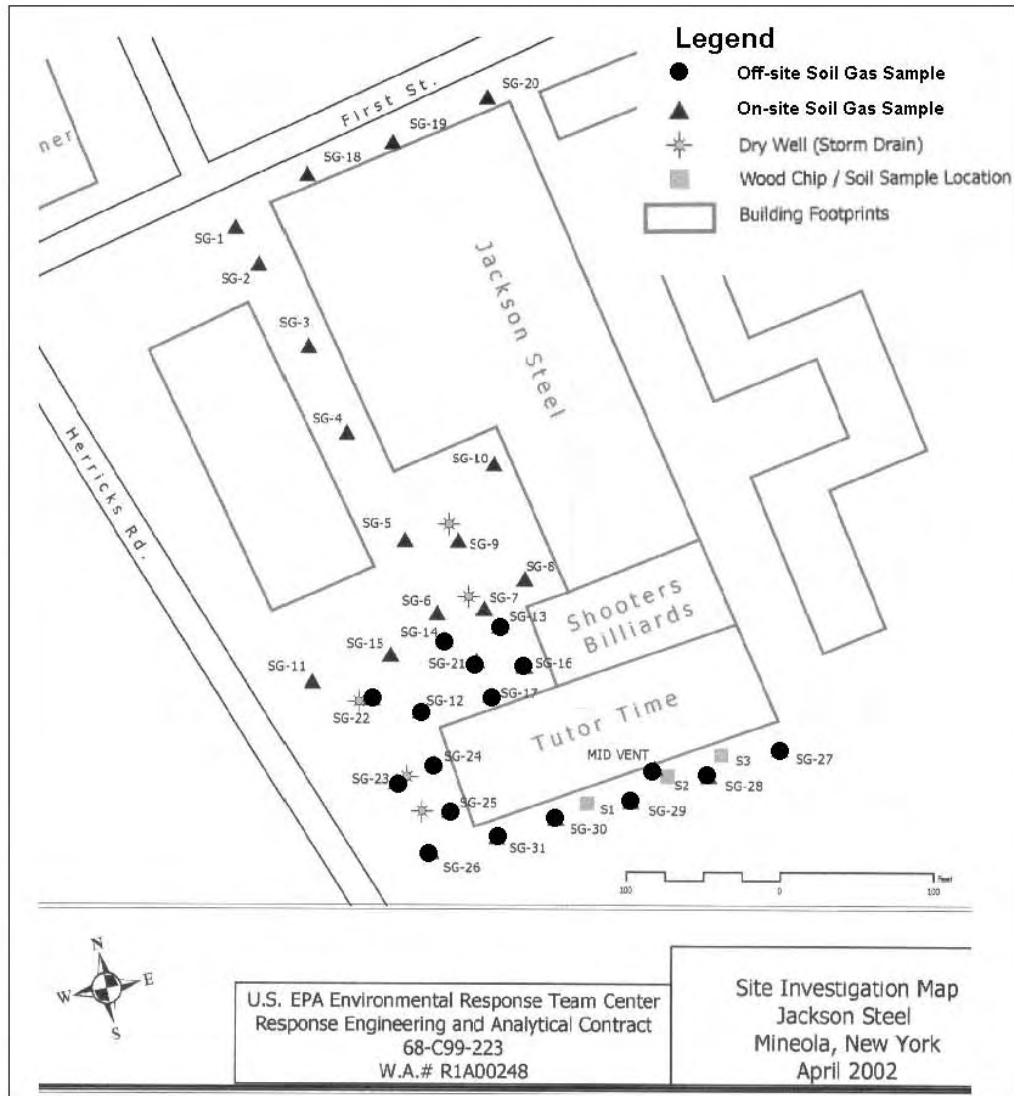


Figure 5
Jackson Steel
Mineola, NY
Nassau County



APPENDIX B

Tables

Table 1
Volatile Organic Compounds in Soil Gas

Sample No.	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Cis-1,2 Dichloroethene (PCE)	1,1,1-Trichloroethane	1,1-Dichloroethane (DCA)
SG-1	370	U	U	U	U
SG-2	96	U	U	3J	U
SG-3	520	U	U	U	U
SG-4	1,100	41 J	U	U	U
SG-5	2,200 D	890	2,000 D	390	150
SG-6	11,000	1,000	1,300	940	230 J
SG-7	1,000	130	160	29 J	U
SG-8	3,200	690	4,800	260 J	140 J
SG-9	9,700	5,000	14,000	2,700	1,100 J
SG-10	4,300	390	750	110 J	U
SG-11	140	U	U	U	U
SG-12	2,000	U	U	U	U
SG-13	1,000	280	330	68 J	U
SG-14	1,100	170	220	140	32 J
SG-15	1,500	78 J	U	50 J	U
SG-16	1,900	450	600	270	59 J
SG-17	290	42 J	U	U	U
SG-18	24	U	U	U	U
SG-19	7	3 J	2 J	U	U
SG-20	23	U	U	U	U
SG-21	54	9	11	8	U
SG-22	540 D	56	U	4 J	U
SG-23	41	4 J	U	U	U
SG-24	120	6 J	U	5 J	U
SG-25	17	U	U	U	U
SG-26	3 J	U	U	U	U
SG-27	U	U	U	U	U
SG-28	4 J	U	U	U	U
SG-29	9	U	U	U	U
SG-30	75	U	U	U	U
SG-31	77	U	U	U	U
Mid-Vent	30	2 J	U	1 J	U

Concentrations given in parts per billion by volume (ppbv)

U = Not Detected. J = Estimated Value, Below Method Detection Limit. D = Concentration from Dilution Run.

Table 2
Summary of NYS DOH/NCHD and US EPA Indoor Air Sampling Events for PCE: 11/29/01 – 4/4/02

Buildings Sampled	NYS DOH/NCDOH Indoor Air Sampling				US EPA Indoor Air Sampling		
	11/29/2001	12/17/2001	1/22/2002	1/29/2002	1/24/2002	2/14/2002	4/4/2002
Tutor Time Bldg.							
Infant Care Rm.		91	21		21/13	22/17	16
Newborn Rm.		90	28		9.9	18.0 (B)	13
Toddler Rm.		130	16/16		7.1	11.52	11
Indoor Playground	60	150	18		7.0/7.5	17/16 (B)	15/14
Learning Ctr. (E)	81	230*	27		10.8	19	16
Pookies Café	78	260	28		11.1/9.6	18/18 (B)	ND/16
Twaddler Rm.			32/32		13	21/21	23
Learning Ctr. (N)	49	66/63	14		8.6	10 (B)	9
Learning Village		90	21			14	16
Learning Ctr. (S)		64/67	21/21		13.9	14 (B)	ND/16
Reception Area						11.3 (B)	16
Laundry/Utility Rm.		46*					
Vacuum Extr. Pipes							
EPA Vent Pipe No. 1					139		
EPA Vent Pipe No. 2							ND
EPA Vent Pipe No. 3					490		ND
EPA Vent Pipe No. 4						3778	
Jackson Steel Bldg.							
Warehouse Interior		13					
Warehouse/EPA Trailer		12					
Loading Dock Fl. Drain		9					
Other Off-site Bdgs.							
Shooters Billiard Hall					169		
Attorney's Office						20 (B)	
Ian McGregor's							
Kitchen		18/18					
Under Bar Floor Drain		18					
Richlee Apts.							
Basement				6/6			
Boiler Rm.				10/9			
Laundry Rm.				5			

All data reported in micrograms per meter cubed (mcg/m³)

* - Results suspicious – badge not sealed properly

B – possible breakthrough or migration

US EPA sampling methodology: 150 mg Coconut Charcoal Tubes, 6X70, 0.2 L/min.

NYS DOH sampling methodology: Passive 3M Badges

ND – Not Detected

All blank spaces are areas not sampled

Table 3

Summary of US EPA Indoor Air Sampling Events for Non-PCE Contaminants: 01/24/02 – 04/04/02

US EPA Indoor Air Sampling – 01/24/02 (mcg/m³)

Tutor Time Bldg.	Bromoform	1,2-DCA
Infant Care Rm.		33.1
Newborn Rm.		39.1
Toddler Rm.		52.4
Indoor Playground		32.46/ND
Learning Ctr. (E)		
Pookies Café		
Twaddler Rm.		
Learning Ctr. (N)		
Learning Village		
Learning Ctr. (S)	246.93	
Reception Area		

US EPA Indoor Air Sampling – 02/14/02 (mcg/m³)

Tutor Time Bldg.	o-DCB	1,1,1-TCA	1,2-DCA	Ethylbenzene	Naphthalene	Xylene	TCE
Infant Care Rm.			33.7				
Newborn Rm.							
Toddler Rm.			33.6			33.6	
Indoor Playground	67.6		33.8/34.2	16.9		110/85.6	
Learning Ctr. (E)	99.1		41.3				
Pookies Café	143		42/40.7		143/106		
Twaddler Rm.			34.8				
Learning Ctr. (N)	164.7				133.8		
Learning Village	134.4		23.7		71.2		
Learning Ctr. (S)	160.6				176.7		
Reception Area	124.4		31.1		101.1		
EPA Vent Pipe No. 4		463					759
Attorney's Office	107.3		48.8		126.8		

US EPA Indoor Air Sampling – 04/04/02 (mcg/m³)

Tutor Time Bldg.	Carbon Tetrachloride	Benzene	n-Hexane	Xylene (Total)	Toluene
Infant Care Rm.					
Newborn Rm.					
Toddler Rm.					
Indoor Playground		48		75/75	
Learning Ctr. (E)					
Pookies Café		15/2.6	96/9.1		100/12
Twaddler Rm.			19		23
Learning Ctr. (N)					
Learning Village					
Learning Ctr. (S)			130		22
Reception Area					

1,2-DCA= 1,2-Dichloroethane 1,1,1-TCA=1,1,1-Trichloroethane o DCB-1,2-Dichlorobenzene TCE=Trichloroethene
All blank spaces = chemical not detected

Table 4
Background Indoor Air Values (All Data mcg/m³)

Compound	EPA Database ¹		NYSDOH Database ²		EPA BASE Data ³		NYSDOH Study ⁴	
	Homes & Offices 1970 - 1988		Homes in NYS 1989 - 1996		Offices 1994 - 1996		Homes in NYS 1997 - 2003	
	Indoor ⁵	Outdoor ⁵	Indoor ⁵	Outdoor ⁵	Indoor ⁵	Outdoor ⁵	Indoor ⁵	Outdoor ⁵
1,2-dichloroethane	ND	ND - 0.22	<1.0	<1.0	<0.6	<0.6	<1.0	<1.0
1,2-dichlorobenzene	ND	ND - 0.23	<2.0	<2.0	<0.9	<1.0	<1.0	<1.0
benzene	3.3 - 21	2.0 - 11	<3.2 - 5	<1.6 - 4.7	2.1 - 5.1	1.2 - 3.7	1.2 - 5.7	<1.0 - 2.6
bromoform	ND	ND	<5.0	<1.0	NA	NA	NA	NA
carbon tetrachloride	ND - 0.8	0.4 - 0.8	<3.1	<3.1	<0.9	<1.0	<1.0 - 1.0 [PL]	<1.0 - 1.0 [PL]
ethylbenzene	2.0 - 9.6	1.0 - 5.4	1.7 - 4.8	<4.3	<1.6 - 3.4	<1.4 - 1.6	1.0 [PL] - 2.8	<1.0 - 1.0 [PL]
m,p-xylene	4.3 - 18	2.0 - 11	2.2 - 9.5	<4.3	4.1 - 12	<3.6 - 7.3	1.0 [PL] - 4.7	<1.0 - 1.0 [PL]
naphthalene	NA	0.2 - 5.7	<10	<3.5	<2.5	<2.4	NA	NA
o-xylene	2.0 - 9.3	1.0 - 6.5	1.9 - 5.0	<4.3	<2.4 - 4.4	<1.4 - 2.6	1.0 [PL] - 3.1	<1.0 - 1.0 [PL]
tetrachloroethene	1.7 - 11	0.82 - 5.9	<3.7	<3.7	<1.9 - 5.9	<1.4 - 3.0	<1.0 - 1.2	<1.5
toluene	NA	0.6 - 20	6.5 - 25	1.0 - 6.1	10.7 - 26	5.9 - 16	4.2 - 25	<1.0 - 3.3

¹The United States Environmental Protection Agency Volatile Organic Compounds Database (EPA database) was published in March 1988. This database is a compilation of indoor and outdoor data from studies across the United States.

²The New York State Department of Health Database (NYSDOH Database) is a summary of indoor and outdoor air sample results in control homes collected and analyzed by NYSDOH from 1989 through 1996.

³The Environmental Protection Agency conducted a study from 1994 through 1996 of indoor air quality referred to as Building Assessment and Survey Evaluation (BASE '94-'96). The study included measurement of volatile organic compounds in indoor and outdoor air at 100 randomly selected public and private office buildings across the United States with no known indoor air related complaints. The study is unpublished and the data summaries presented are Summa canister results only.

⁴The NYSDOH Fuel Oil Study is an unpublished summary of indoor and outdoor air samples collected and analyzed from 104 fuel oil heated homes in NYS from 1997 to 2003. <1.0 values represent the minimum reporting limit for data below the minimum detection limit of 0.2 - 0.5 µg/m³.

⁵The levels are the 25th percentile to 75th percentile, (middle half), of the data from the EPA and NYSDOH databases. Single values represent the minimum reporting limit for a data set where more than 75% of the data are below the detection limit. These databases are comprised of air testing results from studies where there were no known sources of chemicals or chemical spills. < Means "less than". The number following a "less than sign" (<) is the lowest level the laboratory test can reliably measure (reporting limit). If there is a "<" before any number, then the chemical was NOT detected in your sample.

NA - Not Available ND - Not Detected

PL - the value is less than the method reporting limit.

APPENDIX C

**NYS DOH PROCEDURE FOR EVALUATING POTENTIAL HEALTH RISKS
FOR CONTAMINANTS OF CONCERN**

NYS DOH PROCEDURE FOR EVALUATING POTENTIAL HEALTH RISKS
FOR CONTAMINANTS OF CONCERN

To evaluate the potential health risks from contaminants of concern associated with the Jackson Steel Site, the New York State Department of Health assessed the risks for cancer and noncancer health effects.

Increased cancer risks were estimated by using site-specific information on exposure levels for the contaminant of concern and interpreting them using cancer potency estimates derived for that contaminant by US EPA or, in some cases, by the NYS DOH. The following qualitative ranking of cancer risk estimates, developed by the NYS DOH, was then used to rank the risk from very low to very high. For example, if the qualitative descriptor was "low", then the excess lifetime cancer risk from that exposure is in the range of greater than one per million to less than one per ten thousand. Other qualitative descriptors are listed below:

Excess Lifetime Cancer Risk

<u>Risk Ratio</u>	<u>Qualitative Descriptor</u>
equal to or less than one per million	very low
greater than one per million to less than one per ten thousand	low
one per ten thousand to less than one per thousand	moderate
one per thousand to less than one per ten	high
equal to or greater than one per ten	very high

An estimated increased excess lifetime cancer risk is not a specific estimate of expected cancers. Rather, it is a plausible upper bound estimate of the probability that a person may develop cancer sometime in his or her lifetime following exposure to that contaminant.

There is insufficient knowledge of cancer mechanisms to decide if there exists a level of exposure to a cancer-causing agent below which there is no risk of getting cancer, namely, a threshold level. Therefore, every exposure, no matter how low, to a cancer-causing compound is assumed to be associated with some increased risk. As the dose of a carcinogen decreases, the chance of developing cancer decreases, but each exposure is accompanied by some increased risk.

There is general consensus among the scientific and regulatory communities on what level of estimated excess cancer risk is acceptable. An increased lifetime cancer risk of 1-in-1 million or less is generally not considered a significant public health concern.

For noncarcinogenic health risks, the contaminant intake was estimated using exposure assumptions for the site conditions. This dose was then compared to a risk reference dose (estimated daily intake of

a chemical that is likely to be without an appreciable risk of health effects) developed by US EPA, ATSDR and/or NYS DOH. The resulting ratio was then compared to the following qualitative scale of health risk:

Qualitative Descriptions for
Noncarcinogenic Health Risks

<u>Ratio of Estimated Contaminant Intake to Risk Reference Dose</u>	<u>Qualitative Descriptor</u>
equal to or less than the risk reference dose	minimal
greater than one to five times the risk reference dose	low
greater than five to ten times the risk reference dose	moderate
greater than ten times the risk reference dose	high

Noncarcinogenic effects unlike carcinogenic effects are believed to have a threshold, that is, a dose below which adverse effects will not occur. As a result, the current practice is to identify, usually from animal toxicology experiments, a no-observed-effect-level (NOEL). This is the experimental exposure level in animals at which no adverse toxic effect is observed. The NOEL is then divided by an uncertainty factor to yield the risk reference dose. The uncertainty factor is a number which reflects the degree of uncertainty that exists when experimental animal data are extrapolated to the general human population. The magnitude of the uncertainty factor takes into consideration various factors such as sensitive subpopulations (for example, children or the elderly), extrapolation from animals to humans, and the incompleteness of available data. Thus, the risk reference dose is not expected to cause health effects because it is selected to be much lower than dosages that do not cause adverse health effects in laboratory animals.

The measure used to describe the potential for noncancer health effects to occur in an individual is expressed as a ratio of estimated contaminant intake to the risk reference dose. A ratio equal to or less than one is generally not considered a significant public health concern. If exposure to the contaminant exceeds the risk reference dose, there may be concern for potential noncancer health effects because the margin of protection is less than that afforded by the reference dose. As a rule, the greater the ratio of the estimated contaminant intake to the risk reference dose, the greater the level of concern. This level of concern depends upon an evaluation of a number of factors such as the actual potential for exposure, background exposure, and the strength of the toxicologic data.

APPENDIX D
PUBLIC HEALTH HAZARD CATEGORIES

INTERIM PUBLIC HEALTH HAZARD CATEGORIES

CATEGORY / DEFINITION	DATA SUFFICIENCY	CRITERIA
<p>A. Urgent Public Health Hazard</p> <p>This category is used for sites where short-term exposures (< 1 yr) to hazardous substances or conditions could result in adverse health effects that require rapid intervention.</p>	<p>This determination represents a professional judgement based on critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.</p>	<p>Evaluation of available relevant information* indicates that site-specific conditions or likely exposures have had, are having, or are likely to have in the future, an adverse impact on human health that requires immediate action or intervention. Such site-specific conditions or exposures may include the presence of serious physical or safety hazards.</p>
<p>B. Public Health Hazard</p> <p>This category is used for sites that pose a public health hazard due to the existence of long-term exposures (> 1 yr) to hazardous substance or conditions that could result in adverse health effects.</p>	<p>This determination represents a professional judgement based on critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.</p>	<p>Evaluation of available relevant information* suggests that, under site-specific conditions of exposure, long-term exposures to site-specific contaminants (including radio nuclides) have had, are having, or are likely to have in the future, an adverse impact on human health that requires one or more public health interventions. Such site-specific exposures may include the presence of serious physical or safety hazards.</p>
<p>C. Indeterminate Public Health Hazard</p> <p>This category is used for sites in which “critical” data are <i>insufficient</i> with regard to extent of exposure and/or toxicologic properties at estimated exposure levels.</p>	<p>This determination represents a professional judgement that critical data are missing and ATSDR has judged the data are insufficient to support a decision. This does not necessarily imply all data are incomplete; but that some additional data are required to support a decision.</p>	<p>The health assessor must determine, using professional judgement, the “criticality” of such data and the likelihood that the data can be obtained and will be obtained in a timely manner. Where some data are available, even limited data, the health assessor is encouraged to the extent possible to select other hazard categories and to support their decision with clear narrative that explains the limits of the data and the rationale for the decision.</p>
<p>D. No Apparent Public Health Hazard</p> <p>This category is used for sites where human exposure to contaminated media may be occurring, may have occurred in the past, and/or may occur in the future, but the exposure is not expected to cause any adverse health effects.</p>	<p>This determination represents a professional judgement based on critical data which ATSDR considers sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.</p>	<p>Evaluation of available relevant information* indicates that, under site-specific conditions of exposure, exposures to site-specific contaminants in the past, present, or future are not likely to result in any adverse impact on human health.</p>
<p>E: No Public Health Hazard</p> <p>This category is used for sites that, because of the absence of exposure, do NOT pose a public health hazard.</p>	<p>Sufficient evidence indicates that no human exposures to contaminated media have occurred, none are now occurring, and none are likely to occur in the future</p>	

*Such as environmental and demographic data; health outcome data; exposure data; community health concerns information; toxicologic, medical, and epidemiologic data; monitoring and management plans

Appendix E

Summary of Public Comments and Responses

This summary was prepared to address comments and questions on the public comment draft of the Jackson Steel Products Inc Public Health Assessment. The public was invited to review the draft during the public comment period, which originally ran from March 18th, 2004 to April 30th, 2004. Due to public interest, the comment period was extended until July 7th, 2004. We received seven responses, one of which came from a public agency. Some statements were reworded for clarity. If you have any questions about this summary, you can contact the New York State Department of Health's (NYS DOH) project manager for the site at the toll-free number: 1-800-458-1158, extension 27370.

Comment #1 – Why wasn't the environmental consulting firm that first found contamination obligated to report this health hazard?

Response #1 – Unfortunately, environmental consulting firms doing business for a particular client are not required to report their findings to anyone other than their client.

Comment #2 – What is being done to prevent future public facilities from being licensed to open near known contaminated sites?

Response #2 – The agencies responsible for permitting and licensing public facilities such as daycare centers and schools are developing procedures that will assist them in the placement of these facilities.

Comment #3 – What level of each air contaminant listed in Table 3 is considered normal?

Response #3 – The “normal” level or what we refer to as the indoor background level for the contaminants in Table 3 are discussed in Table 4. Indoor background levels are the levels of the chemicals that are typically found in the indoor air environment, absent overt chemical contamination.

Comment #4 – Should affected children still be tested every year?

Response #4 – Volatile organic compounds, such as tetrachloroethene, that were detected in indoor air at the Tutor Time Daycare Center, do not persist in the body for very long after the exposure stops. Because people are no longer exposed to these chemicals from the Jackson Steel site, biological monitoring for these VOCs or their metabolites is not useful.

Research studies have not identified specific medical tests to look for effects from these chemicals. Biological tests such as urinalysis or blood chemistry analyses are useful, while non-specific for VOC exposure, tools for identifying general health problems early. An individual's physician may have already used these routine tests when giving periodic checkups in the past. Physicians evaluate test results by comparing them to normal ranges for your sex and age. A wide range of medical conditions can cause abnormal findings in these tests. Each physician also interprets an individual's results in relation to individual medical histories. Residents may wish to tell their physician about their exposure to VOCs because the physician will consider their patient's personal health history when deciding the types of tests needed and how frequently their patients need to be seen. If your physician would like to talk with a NYS DOH environmental health nurse or physician, they should contact the NYS DOH at 1-800-458-1158, extension 27950.

Comment #5 – EPA should implement an appropriate remedy to remove the source of soil contamination at the Jackson Steel site.

Response #5 – EPA has proposed to use soil vapor extraction to remediate the on-site soil contamination, which would be an appropriate remedy to remove the source of soil contamination at the Jackson Steel site.

Comment #6 – How do I register with the VOC Registry?

Response #6 – The VOC Exposure Registry has offered enrollment to children and employees of the former Tutor Time Daycare Center. The NYS DOH will maintain contact with the exposed population so health status updates can be obtained periodically. If you feel you may qualify for inclusion in the VOC Registry and have not been contacted, please contact Megan Meldrum, at 1-800-458-1158, extension 27950.

Comment #7 – I concluded from this assessment that the cancer risks to children are simply not known. The report states the risk of cancer is low, but there is still a risk. The probability numbers offered at one in a million or one in ten thousand are misleading. EPA classified tetrachloroethene as a probable human carcinogen but the threshold level is not known. “The health effects of breathing in air or drinking water with low levels of tetrachloroethene are not known” (ATSDR – tetrachloroethene – CAS # 127-18-4). You have no answers on how this will affect my children. That needs to be put in the assessment in plain English. What is currently being done by the NYSDOH to estimate the pre-remediation cancer risk of the daycare children?

Response # 7: As indicated in the comment, "the health effects of breathing in air or drinking water with low levels of tetrachloroethene are not known." This is also true of most chemicals, and therefore estimates of the health risks from chemical exposures are usually made using information from high level exposures in animals or in humans. In the Jackson Steel public health assessment, we did not estimate the increase in cancer risk for specific individuals. The health assessment assumed that people were exposed to the average detected level of tetrachloroethene for ten hours per day, five days per week for six years (which coincides with the time the Tutor Time facility was in operation). These assumptions provide a reasonable yet conservative estimate of people's exposure. Based on these assumptions and available toxicity information for tetrachloroethene, the assessment provided estimates of the likelihood that people working or using the Tutor Time facility could get cancer. These estimates ranged (as was stated in the document) from 2.3 in 1,000,000 to 2.6 in 1,000,000 for the time period prior to the initiation of remedial activities. Thus, while the commenter is correct that we cannot make specific predictions on how the exposures may affect his or her children, we are able to estimate, based on exposure assumptions and the available information on the toxicity of tetrachloroethene, that the increased cancer risk is low (i.e., the quantitative estimates fall between 1 in 1,000,000 and 1 in 10,000).

The US EPA classification of tetrachloroethene as a probable human carcinogen is based on sufficient evidence for carcinogenicity in animals and limited evidence for carcinogenicity in humans. We do not know for certain if tetrachloroethene causes cancer in humans. There are no further or current efforts underway to estimate the cancer risk for the daycare children because

the cancer risk was evaluated and presented in the health assessment document using all the information available to us. We will be willing to consider further evaluating the cancer risks for children or staff at the Tutor Time facility should additional and reliable information arise that would enable us to do so.

Comment #8 – I am concerned that the previous lessors of this building, which leased this space from the current owner for more than 10years, have never been contacted by the NYS DOH. I ask that you please send them a copy of the public health assessment as well as information for their long-term employees to consider registration into the VOC Registry. At least one employee is experiencing health concerns which she feels may be as a result to exposures during her employment in the 80 Herricks Road building.

Response #8 – We mailed a copy of this health consultation, which includes information about the VOC Registry, to the previous lessors of the building, as requested. Through direct contact, phone calls, mailing and public meetings, NYS DOH staff have tried to contact all people known to be associated with the First Street or Herricks Road buildings, the former Jackson Steel facility, the former Tutor Time Daycare, and the former Shooter’s Billiards Club. Many people have discussed their site-related health concerns with us. Agency staff (NYS DOH, NYS DEC and US EPA) continue to be available to employees and parents of children from the Daycare Center if they have questions concerning the site or site-related health issues.

APPENDIX F

Glossary

ATSDR Glossary of Terms

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal public health agency with headquarters in Atlanta, Georgia, and 10 regional offices in the United States. ATSDR's mission is to serve the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposures and diseases related to toxic substances. ATSDR is not a regulatory agency, unlike the U.S. Environmental Protection Agency (EPA), which is the federal agency that develops and enforces environmental laws to protect the environment and human health. This glossary defines words used by ATSDR in communications with the public. It is not a complete dictionary of environmental health terms. If you have questions or comments, call ATSDR's toll-free telephone number, 1-888-42-ATSDR (1-888-422-8737).

General Terms

Absorption

The process of taking in. For a person or an animal, absorption is the process of a substance getting into the body through the eyes, skin, stomach, intestines, or lungs.

Acute

Occurring over a short time [compare with chronic].

Acute exposure

Contact with a substance that occurs once or for only a short time (up to 14 days) [compare with intermediate duration exposure and chronic exposure].

Additive effect

A biologic response to exposure to multiple substances that equals the sum of responses of all the individual substances added together [compare with antagonistic effect and synergistic effect].

Adverse health effect

A change in body function or cell structure that might lead to disease or health problems

Aerobic

Requiring oxygen [compare with anaerobic].

Ambient

Surrounding (for example, ambient air).

Anaerobic

Requiring the absence of oxygen [compare with aerobic].

Analyte

A substance measured in the laboratory. A chemical for which a sample (such as water, air, or blood) is tested in a laboratory. For example, if the analyte is mercury, the laboratory test will determine the amount of mercury in the sample.

Analytic epidemiologic study

A study that evaluates the association between exposure to hazardous substances and disease by testing scientific hypotheses.

Antagonistic effect

A biologic response to exposure to multiple substances that is less than would be expected if the known effects of the individual substances were added together [compare with additive effect and synergistic effect].

Background level

An average or expected amount of a substance or radioactive material in a specific environment, or typical amounts of substances that occur naturally in an environment.

Biodegradation

Decomposition or breakdown of a substance through the action of microorganisms (such as bacteria or fungi) or other natural physical processes (such as sunlight).

Biologic indicators of exposure study

A study that uses (a) biomedical testing or (b) the measurement of a substance [an analyte], its metabolite, or another marker of exposure in human body fluids or tissues to confirm human exposure to a hazardous substance [also see exposure investigation].

Biologic monitoring

Measuring hazardous substances in biologic materials (such as blood, hair, urine, or breath) to determine whether exposure has occurred. A blood test for lead is an example of biologic monitoring.

Biologic uptake

The transfer of substances from the environment to plants, animals, and humans.

Biomedical testing

Testing of persons to find out whether a change in a body function might have occurred because of exposure to a hazardous substance.

Biota

Plants and animals in an environment. Some of these plants and animals might be sources of food, clothing, or medicines for people.

Body burden

The total amount of a substance in the body. Some substances build up in the body because they are stored in fat or bone or because they leave the body very slowly.

CAP [see Community Assistance Panel.]

Cancer

Any one of a group of diseases that occur when cells in the body become abnormal and grow or multiply out of control.

Cancer risk

A theoretical risk for getting cancer if exposed to a substance every day for 70 years (a lifetime exposure). The true risk might be lower.

Carcinogen

A substance that causes cancer.

Case study

A medical or epidemiologic evaluation of one person or a small group of people to gather information about specific health conditions and past exposures.

Case-control study

A study that compares exposures of people who have a disease or condition (cases) with people who do not have the disease or condition (controls). Exposures that are more common among the cases may be considered as possible risk factors for the disease.

CAS registry number

A unique number assigned to a substance or mixture by the American Chemical Society Abstracts Service.

Central nervous system

The part of the nervous system that consists of the brain and the spinal cord.

CERCLA [see Comprehensive Environmental Response, Compensation, and Liability Act of 1980]

Chronic

Occurring over a long time [compare with acute].

Chronic exposure

Contact with a substance that occurs over a long time (more than 1 year) [compare with acute exposure and intermediate duration exposure]

Cluster investigation

A review of an unusual number, real or perceived, of health events (for example, reports of cancer) grouped together in time and location. Cluster investigations are designed to confirm case reports; determine whether they represent an unusual disease occurrence; and, if possible, explore possible causes and contributing environmental factors.

Community Assistance Panel (CAP)

A group of people from a community and from health and environmental agencies who work with ATSDR to resolve issues and problems related to hazardous substances in the community. CAP members work with ATSDR to gather and review community health concerns, provide information on how people might have been or might now be exposed to hazardous substances, and inform ATSDR on ways to involve the community in its activities.

Comparison value (CV)

Calculated concentration of a substance in air, water, food, or soil that is unlikely to cause harmful (adverse) health effects in exposed people. The CV is used as a screening level during the public health assessment process. Substances found in amounts greater than their CVs might be selected for further evaluation in the public health assessment process.

Completed exposure pathway [see exposure pathway].

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)

CERCLA, also known as Superfund, is the federal law that concerns the removal or cleanup of hazardous substances in the environment and at hazardous waste sites. ATSDR, which was created by CERCLA, is responsible for assessing health issues and supporting public health activities related to hazardous waste sites or other environmental releases of hazardous substances. This law was later amended by the Superfund Amendments and Reauthorization Act (SARA).

Concentration

The amount of a substance present in a certain amount of soil, water, air, food, blood, hair, urine, breath, or any other media.

Contaminant

A substance that is either present in an environment where it does not belong or is present at levels that might cause harmful (adverse) health effects.

Delayed health effect

A disease or an injury that happens as a result of exposures that might have occurred in the past.

Dermal

Referring to the skin. For example, dermal absorption means passing through the skin.

Dermal contact

Contact with (touching) the skin [see route of exposure].

Descriptive epidemiology

The study of the amount and distribution of a disease in a specified population by person, place, and time.

Detection limit

The lowest concentration of a chemical that can reliably be distinguished from a zero concentration.

Disease prevention

Measures used to prevent a disease or reduce its severity.

Disease registry

A system of ongoing registration of all cases of a particular disease or health condition in a defined population.

DOD

United States Department of Defense.

DOE

United States Department of Energy.

Dose (for chemicals that are not radioactive)

The amount of a substance to which a person is exposed over some time period. Dose is a measurement of exposure. Dose is often expressed as milligram (amount) per kilogram (a measure of body weight) per day (a measure of time) when people eat or drink contaminated water, food, or soil. In general, the greater the dose, the greater the likelihood of an effect. An "exposure dose" is how much of a substance is encountered in the environment. An "absorbed dose" is the amount of a substance that actually got into the body through the eyes, skin, stomach, intestines, or lungs.

Dose (for radioactive chemicals)

The radiation dose is the amount of energy from radiation that is actually absorbed by the body. This is not the same as measurements of the amount of radiation in the environment.

Dose-response relationship The relationship between the amount of exposure [dose] to a substance and the resulting changes in body function or health (response).

Environmental media

Soil, water, air, biota (plants and animals), or any other parts of the environment that can contain contaminants.

Environmental media and transport mechanism

Environmental media include water, air, soil, and biota (plants and animals). Transport mechanisms move contaminants from the source to points where human exposure can occur. The environmental media and transport mechanism is the second part of an exposure pathway.

EPA

United States Environmental Protection Agency.

Epidemiologic surveillance [see Public health surveillance].

Epidemiology

The study of the distribution and determinants of disease or health status in a population; the study of the occurrence and causes of health effects in humans.

Exposure

Contact with a substance by swallowing, breathing, or touching the skin or eyes. Exposure may be short-term [acute exposure], of intermediate duration, or long-term [chronic exposure].

Exposure assessment

The process of finding out how people come into contact with a hazardous substance, how often and for how long they are in contact with the substance, and how much of the substance they are

in contact with.

Exposure-dose reconstruction

A method of estimating the amount of people's past exposure to hazardous substances. Computer and approximation methods are used when past information is limited, not available, or missing.

Exposure investigation

The collection and analysis of site-specific information and biologic tests (when appropriate) to determine whether people have been exposed to hazardous substances.

Exposure pathway

The route a substance takes from its source (where it began) to its end point (where it ends), and how people can come into contact with (or get exposed to) it. An exposure pathway has five parts: a source of contamination (such as an abandoned business); an environmental media and transport mechanism (such as movement through groundwater); a point of exposure (such as a private well); a route of exposure (eating, drinking, breathing, or touching), and a receptor population (people potentially or actually exposed). When all five parts are present, the exposure pathway is termed a completed exposure pathway.

Exposure registry

A system of ongoing followup of people who have had documented environmental exposures.

Feasibility study

A study by EPA to determine the best way to clean up environmental contamination. A number of factors are considered, including health risk, costs, and what methods will work well.

Geographic information system (GIS)

A mapping system that uses computers to collect, store, manipulate, analyze, and display data. For example, GIS can show the concentration of a contaminant within a community in relation to points of reference such as streets and homes.

Grand rounds

Training sessions for physicians and other health care providers about health topics.

Groundwater

Water beneath the earth's surface in the spaces between soil particles and between rock surfaces [compare with surface water].

Half-life ($t_{1/2}$)

The time it takes for half the original amount of a substance to disappear. In the environment, the half-life is the time it takes for half the original amount of a substance to disappear when it is changed to another chemical by bacteria, fungi, sunlight, or other chemical processes. In the human body, the half-life is the time it takes for half the original amount of the substance to disappear, either by being changed to another substance or by leaving the body. In the case of radioactive material, the half life is the amount of time necessary for one half the initial number of radioactive atoms to change or transform into another atom (that is normally not radioactive). After two half lives, 25% of the original number of radioactive atoms remain.

Hazard

A source of potential harm from past, current, or future exposures.

Hazardous Substance Release and Health Effects Database (HazDat)

The scientific and administrative database system developed by ATSDR to manage data collection, retrieval, and analysis of site-specific information on hazardous substances, community health concerns, and public health activities.

Hazardous waste

Potentially harmful substances that have been released or discarded into the environment.

Health consultation

A review of available information or collection of new data to respond to a specific health question or request for information about a potential environmental hazard. Health consultations are focused on a specific exposure issue. Health consultations are therefore more limited than a public health assessment, which reviews the exposure potential of each pathway and chemical [compare with public health assessment].

Health education

Programs designed with a community to help it know about health risks and how to reduce these risks.

Health investigation

The collection and evaluation of information about the health of community residents. This information is used to describe or count the occurrence of a disease, symptom, or clinical measure and to evaluate the possible association between the occurrence and exposure to hazardous substances.

Health promotion

The process of enabling people to increase control over, and to improve, their health.

Health statistics review

The analysis of existing health information (i.e., from death certificates, birth defects registries, and cancer registries) to determine if there is excess disease in a specific population, geographic area, and time period. A health statistics review is a descriptive epidemiologic study.

Indeterminate public health hazard

The category used in ATSDR's public health assessment documents when a professional judgment about the level of health hazard cannot be made because information critical to such a decision is lacking.

Incidence

The number of new cases of disease in a defined population over a specific time period [contrast with prevalence].

Ingestion

The act of swallowing something through eating, drinking, or mouthing objects. A hazardous substance can enter the body this way [see route of exposure].

Inhalation

The act of breathing. A hazardous substance can enter the body this way [see route of exposure].

Intermediate duration exposure

Contact with a substance that occurs for more than 14 days and less than a year [compare with acute exposure and chronic exposure].

In vitro

In an artificial environment outside a living organism or body. For example, some toxicity testing is done on cell cultures or slices of tissue grown in the laboratory, rather than on a living animal [compare with in vivo].

In vivo

Within a living organism or body. For example, some toxicity testing is done on whole animals, such as rats or mice [compare with in vitro].

Lowest-observed-adverse-effect level (LOAEL)

The lowest tested dose of a substance that has been reported to cause harmful (adverse) health effects in people or animals.

Medical monitoring

A set of medical tests and physical exams specifically designed to evaluate whether an individual's exposure could negatively affect that person's health.

Metabolism

The conversion or breakdown of a substance from one form to another by a living organism.

Metabolite

Any product of metabolism.

mg/kg

Milligram per kilogram.

mg/cm²

Milligram per square centimeter (of a surface).

mg/m³

Milligram per cubic meter; a measure of the concentration of a chemical in a known volume (a cubic meter) of air, soil, or water.

Migration

Moving from one location to another.

Minimal risk level (MRL)

An ATSDR estimate of daily human exposure to a hazardous substance at or below which that substance is unlikely to pose a measurable risk of harmful (adverse), noncancerous effects. MRLs are calculated for a route of exposure (inhalation or oral) over a specified time period (acute, intermediate, or chronic). MRLs should not be used as predictors of harmful (adverse) health effects [see reference dose].

Morbidity

State of being ill or diseased. Morbidity is the occurrence of a disease or condition that alters health and quality of life.

Mortality

Death. Usually the cause (a specific disease, a condition, or an injury) is stated.

Mutagen

A substance that causes mutations (genetic damage).

Mutation

A change (damage) to the DNA, genes, or chromosomes of living organisms.

National Priorities List for Uncontrolled Hazardous Waste Sites (National Priorities List or NPL)

EPA's list of the most serious uncontrolled or abandoned hazardous waste sites in the United States. The NPL is updated on a regular basis.

National Toxicology Program (NTP)

Part of the Department of Health and Human Services. NTP develops and carries out tests to predict whether a chemical will cause harm to humans.

No apparent public health hazard

A category used in ATSDR's public health assessments for sites where human exposure to contaminated media might be occurring, might have occurred in the past, or might occur in the future, but where the exposure is not expected to cause any harmful health effects.

No-observed-adverse-effect level (NOAEL)

The highest tested dose of a substance that has been reported to have no harmful (adverse) health effects on people or animals.

No public health hazard

A category used in ATSDR's public health assessment documents for sites where people have never and will never come into contact with harmful amounts of site-related substances.

NPL [see National Priorities List for Uncontrolled Hazardous Waste Sites]

Physiologically based pharmacokinetic model (PBPK model)

A computer model that describes what happens to a chemical in the body. This model describes how the chemical gets into the body, where it goes in the body, how it is changed by the body, and how it leaves the body.

Pica

A craving to eat nonfood items, such as dirt, paint chips, and clay. Some children exhibit pica-related behavior.

Plume

A volume of a substance that moves from its source to places farther away from the source.

Plumes can be described by the volume of air or water they occupy and the direction they move. For example, a plume can be a column of smoke from a chimney or a substance moving with groundwater.

Point of exposure

The place where someone can come into contact with a substance present in the environment [see exposure pathway].

Population

A group or number of people living within a specified area or sharing similar characteristics (such as occupation or age).

Potentially responsible party (PRP)

A company, government, or person legally responsible for cleaning up the pollution at a hazardous waste site under Superfund. There may be more than one PRP for a particular site.

ppb

Parts per billion.

ppm

Parts per million.

Prevalence

The number of existing disease cases in a defined population during a specific time period [contrast with incidence].

Prevalence survey

The measure of the current level of disease(s) or symptoms and exposures through a questionnaire that collects self-reported information from a defined population.

Prevention

Actions that reduce exposure or other risks, keep people from getting sick, or keep disease from getting worse.

Public availability session

An informal, drop-by meeting at which community members can meet one-on-one with ATSDR staff members to discuss health and site-related concerns.

Public comment period

An opportunity for the public to comment on agency findings or proposed activities contained in draft reports or documents. The public comment period is a limited time period during which comments will be accepted.

Public health action

A list of steps to protect public health.

Public health advisory

A statement made by ATSDR to EPA or a state regulatory agency that a release of hazardous substances poses an immediate threat to human health. The advisory includes recommended measures to reduce exposure and reduce the threat to human health.

Public health assessment (PHA)

An ATSDR document that examines hazardous substances, health outcomes, and community concerns at a hazardous waste site to determine whether people could be harmed from coming into contact with those substances. The PHA also lists actions that need to be taken to protect public health [compare with health consultation].

Public health hazard

A category used in ATSDR's public health assessments for sites that pose a public health hazard because of long-term exposures (greater than 1 year) to sufficiently high levels of hazardous substances or radionuclides that could result in harmful health effects.

Public health hazard categories

Public health hazard categories are statements about whether people could be harmed by conditions present at the site in the past, present, or future. One or more hazard categories might be appropriate for each site. The five public health hazard categories are no public health hazard, no apparent public health hazard, indeterminate public health hazard, public health hazard, and urgent public health hazard.

Public health statement

The first chapter of an ATSDR toxicological profile. The public health statement is a summary written in words that are easy to understand. The public health statement explains how people might be exposed to a specific substance and describes the known health effects of that substance.

Public health surveillance

The ongoing, systematic collection, analysis, and interpretation of health data. This activity also involves timely dissemination of the data and use for public health programs.

Public meeting

A public forum with community members for communication about a site.

Radioisotope

An unstable or radioactive isotope (form) of an element that can change into another element by giving off radiation.

Radionuclide

Any radioactive isotope (form) of any element.

RCRA [see Resource Conservation and Recovery Act (1976, 1984)]

Receptor population

People who could come into contact with hazardous substances [see exposure pathway].

Reference dose (RfD)

An EPA estimate, with uncertainty or safety factors built in, of the daily lifetime dose of a substance that is unlikely to cause harm in humans.

Registry

A systematic collection of information on persons exposed to a specific substance or having specific diseases [see exposure registry and disease registry].

Remedial investigation

The CERCLA process of determining the type and extent of hazardous material contamination at a site.

Resource Conservation and Recovery Act (1976, 1984) (RCRA)

This Act regulates management and disposal of hazardous wastes currently generated, treated, stored, disposed of, or distributed.

RFA

RCRA Facility Assessment. An assessment required by RCRA to identify potential and actual releases of hazardous chemicals.

RfD [see reference dose]

Risk

The probability that something will cause injury or harm.

Risk reduction

Actions that can decrease the likelihood that individuals, groups, or communities will experience disease or other health conditions.

Risk communication

The exchange of information to increase understanding of health risks.

Route of exposure

The way people come into contact with a hazardous substance. Three routes of exposure are breathing [inhalation], eating or drinking [ingestion], or contact with the skin [dermal contact].

Safety factor [see uncertainty factor]

SARA [see Superfund Amendments and Reauthorization Act]

Sample

A portion or piece of a whole. A selected subset of a population or subset of whatever is being studied. For example, in a study of people the sample is a number of people chosen from a larger population [see population]. An environmental sample (for example, a small amount of soil or water) might be collected to measure contamination in the environment at a specific location.

Sample size

The number of units chosen from a population or an environment.

Solvent

A liquid capable of dissolving or dispersing another substance (for example, acetone or mineral spirits).

Source of contamination

The place where a hazardous substance comes from, such as a landfill, waste pond, incinerator, storage tank, or drum. A source of contamination is the first part of an exposure pathway.

Special populations

People who might be more sensitive or susceptible to exposure to hazardous substances because of factors such as age, occupation, sex, or behaviors (for example, cigarette smoking). Children, pregnant women, and older people are often considered special populations.

Stakeholder

A person, group, or community who has an interest in activities at a hazardous waste site.

Statistics

A branch of mathematics that deals with collecting, reviewing, summarizing, and interpreting data or information. Statistics are used to determine whether differences between study groups are meaningful.

Substance

A chemical.

Substance-specific applied research

A program of research designed to fill important data needs for specific hazardous substances identified in ATSDR's toxicological profiles. Filling these data needs would allow more accurate assessment of human risks from specific substances contaminating the environment. This research might include human studies or laboratory experiments to determine health effects resulting from exposure to a given hazardous substance.

Superfund [see Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and Superfund Amendments and Reauthorization Act (SARA)]

Superfund Amendments and Reauthorization Act (SARA)

In 1986, SARA amended the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and expanded the health-related responsibilities of ATSDR. CERCLA and SARA direct ATSDR to look into the health effects from substance exposures at

hazardous waste sites and to perform activities including health education, health studies, surveillance, health consultations, and toxicological profiles.

Surface water

Water on the surface of the earth, such as in lakes, rivers, streams, ponds, and springs [compare with groundwater].

Surveillance [see public health surveillance]

Survey

A systematic collection of information or data. A survey can be conducted to collect information

from a group of people or from the environment. Surveys of a group of people can be conducted by telephone, by mail, or in person. Some surveys are done by interviewing a group of people [see prevalence survey].

Synergistic effect

A biologic response to multiple substances where one substance worsens the effect of another substance. The combined effect of the substances acting together is greater than the sum of the effects of the substances acting by themselves [see additive effect and antagonistic effect].

Teratogen

A substance that causes defects in development between conception and birth. A teratogen is a substance that causes a structural or functional birth defect.

Toxic agent

Chemical or physical (for example, radiation, heat, cold, microwaves) agents that, under certain circumstances of exposure, can cause harmful effects to living organisms.

Toxicological profile

An ATSDR document that examines, summarizes, and interprets information about a hazardous substance to determine harmful levels of exposure and associated health effects. A toxicological profile also identifies significant gaps in knowledge on the substance and describes areas where further research is needed.

Toxicology

The study of the harmful effects of substances on humans or animals.

Tumor

An abnormal mass of tissue that results from excessive cell division that is uncontrolled and progressive. Tumors perform no useful body function. Tumors can be either benign (not cancer) or malignant (cancer).

Uncertainty factor

Mathematical adjustments for reasons of safety when knowledge is incomplete. For example, factors used in the calculation of doses that are not harmful (adverse) to people. These factors are applied to the lowest-observed-adverse-effect-level (LOAEL) or the no-observed-adverse-effect-level (NOAEL) to derive a minimal risk level (MRL). Uncertainty factors are used to account for variations in people's sensitivity, for differences between animals and humans, and for differences between a LOAEL and a NOAEL. Scientists use uncertainty factors when they have some, but not all, the information from animal or human studies to decide whether an exposure will cause harm to people [also sometimes called a safety factor].

Urgent public health hazard

A category used in ATSDR's public health assessments for sites where short-term exposures (less than 1 year) to hazardous substances or conditions could result in harmful health effects that require rapid intervention.

Volatile organic compounds (VOCs)

Organic compounds that evaporate readily into the air. VOCs include substances such as benzene, toluene, methylene chloride, and methyl chloroform.

Other glossaries and dictionaries:

Environmental Protection Agency (<http://www.epa.gov/OCEPAterms/>)

National Center for Environmental Health (CDC)
(<http://www.cdc.gov/nceh/dls/report/glossary.htm>)

National Library of Medicine (NIH)
(<http://www.nlm.nih.gov/medlineplus/mplusdictionary.html>)

For more information on the work of ATSDR, please contact:

Office of Policy and External Affairs
Agency for Toxic Substances and Disease Registry
1600 Clifton Road, N.E. (MS E-60)
Atlanta, GA 30333
Telephone: (404) 498-0080